Türkçe Mors Code (Türkçe Mors Kodu - TMK)

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ABSTRACT

This project aims to eliminate the deficiency that arises due to the current Morse code system not supporting Turkish characters. Within the scope of the project, a new Morse code containing Turkish characters was developed using an Arduino-based system and the effective usability of this code in communication was tested. In the study, a practical solution proposal was presented with a Morse code generating encoder. During the experimental study, audio and visual feedback was provided using hardware elements such as LCD screen, LED and buzzer. The new code sequence was integrated into the current Morse code system and Turkish characters were transmitted correctly. The findings obtained show that Turkish characters can be transmitted successfully within the Morse code system and will contribute to the field of communication. This study makes significant contributions, especially in terms of amateur radio and educational applications. The project also aims to create a model for STEM-based educational studies and to increase students' interest in electronics, communication technologies and coding.

Keywords: **Morse code, Turkish characters, amateur radio, Arduino, communication technologies**

INTRODUCTİON

Communication has been one of the most basic needs in human history and has evolved in different ways over time with the advancement of technology. Since the early ages, communication between long distances has been achieved by using methods such as smoke, drums, pigeons and signal flags. The invention of the telegraph in the 19th century has been accepted as a revolutionary development in long-distance communication. However, since telegraph systems only provided communication between certain centers, they were inadequate for ships on the move and users in remote areas. In response to this need, Samuel Morse and his team developed the Morse code system, which works with electrical pulses (Yıldırım, n.d.). Morse code has created a great revolution, especially for transoceanic communication, railways and the transmission of critical information during wartime. One of the greatest advantages of Morse code is that it can be easily transmitted with simple equipment and provides effective communication even at low bandwidth over radio waves. For this reason, it plays a critical role especially in amateur radio and emergency communications. It can work over long distances. Even when wired and cellular communications are down due to power outages or natural disasters, radio systems and radio frequencies can continue to be used.

METHOD/EXPERIMENT

Method

In this research, an encoder that can convert Turkish characters to Morse code and a decoder that decodes these codes were developed using the Arduino microcontroller. An experimental approach was adopted for the development of the system during the research process.

1- Development of Turkish Code

First of all, a new Morse code sequence supporting Turkish characters was created. Software support was obtained for the display of Turkish characters on the LCD screen, which is important for the Decoder section. The display of Turkish characters on the LCD screen was completed and the next stage of the project was moved on.

2- Implementation of the Encoder Study

A ready library was used in the Arduino IDE program for the encoder section (Özcan, 2017). When letters were written to the serial screen, dii and dah sounds were received from the buzzer in the circuit and light warnings were received in the form of long and short flashes with the LED.

3- Implementation of the Decoder Study

A software update was made by adding Turkish character Morse codes to the ready library for the Decoder section in the Arduino IDE program.
The obtained data was analyzed in order to provide concrete outputs for the integration of Turkish characters into communication systems. The study was conducted with an approach that could contribute to a new R&D process in communication technologies.

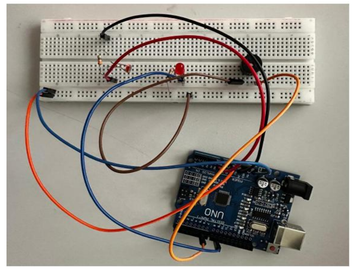
Audio and visual feedback was provided using an LCD screen and a buzzer,

- LCD screen
- Buzzer
- Led
- Arduino
- Breadboard
- Some Wire
- Use images

DATA AND ANALYSIS

In this research study, we were able to conduct the encoder study. In the decoder study, we could not achieve the results we expected in the coding phase. Our work on this issue continues.

We provided communication in Turkish characters from our station radio with our call sign YM2VKA in Karabük province. While one of us was on the station fixed radio with a part of the crew, the other provided Morse transmission in Turkish characters with the rest of our crew in the schoolyard with the Baofeng UV-82. Providing communication experience in our own language created a positive effect in terms of preserving our cultural values in communication studies. In this way, we aimed to contribute to the international spread of our Turkish language.



Letter	Mors Code	Letter	Standart Mors code	Developed mors code
C	-.-.	Ç	NA	-.-..
G	--.	Ğ	NA	--.--
I	..	İ	NA	..-..
O	---	Ö	NA	---.
S	...	Ş	NA	...-.
U	..-	Ü	NA	..--.

References

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Mars on Earth Project (MoEP) 78-1 School Ham Radio Station
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